

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>030856WO</b>	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/011848</b>	International filing date ( <i>day/month/year</i> ) <b>20.10.2004</b>	Priority date ( <i>day/month/year</i> ) <b>21.10.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>B22D11/06</b>			
Applicant <b>THYSSENKRUPP NIROSTA GMBH</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>8</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
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<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP2004/011848

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
 
  - international search (Rule 12.3 and 23.1(b))
  - publication of the international application (Rule 12.4)
  - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 

the international application as originally filed/furnished  
 the description:  
 pages 1-13 as originally filed/furnished  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:  
 nos. 1-9 as originally filed/furnished  
 nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
 nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:  
 sheets 1/2, 2/2 as originally filed/furnished  
 sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3.  The amendments have resulted in the cancellation of:
 

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP2004/011848

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty (N)	Claims	1 – 9	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1 – 9	NO
Industrial applicability (IA)	Claims	1 – 9	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

## 1. Reference is made to the following documents:

D1: EP 0 409 645 B (NIPPON STEEL CORPORATION;  
MITSUBISHI JUKOGYO KABUSHIKI KAISHA)  
23 January 1991 (1991-01-23)

D2: DE 24 12 149 A1 (BATTELLE DEVELOPMENT CORP.,  
COLUMBUS, OHIO) 17 October 1974 (1974-10-17)

D3: US 5 259 443 A (OSADA ET AL)  
9 November 1993 (1993-11-09)

D4: EP 0 463 182 A (NIPPON STEEL CORPORATION)  
2 January 1992 (1992-01-02)

D5: HAMMAR, SVENSSON: SOLIDIFICATION AND CASTING  
OF METALS, 1979, pages 401-410, XP008050563.

1a. The applicant's letter of 8 November 2005 has been taken into account.

## 2. INDEPENDENT CLAIM 1

2.1 **The present application fails to satisfy the requirements of PCT Article 33(1) because the subject matter of claim 1 does not involve an inventive step (PCT Article 33(3)).**

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP2004/011848**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Document D1 is considered to be the prior art closest to the subject matter of claim 1. Said document discloses a method for the production of a cast steel strip, a steel melt being cast to form the steel strip in a continuous production process in a casting slot, the longitudinal sides thereof being formed by walls which move during the casting process, and the steel melt which overflows from the casting slot being gathered in a melt pool and kept in a nitrogen and hydrogen atmosphere. The respective amounts of Cr, Mo, Nb, Si, Ti, Ni, Mn, C and N in the cast steel melt, optionally present in each case for adjusting the properties of the steel strip, are chosen such that for the ratio formed from the Cr equivalent  $Cr_{eq}$  and the Ni equivalent  $Ni_{eq}$ :

$$Cr_{eq}/Ni_{eq}, Cr_{eq}/Ni_{eq} \geq 1.7$$

with

$$Cr_{eq} = \%Cr + 1.37\%Mo + 2\%Nb + 1.5\%Si + 3\%Ti,$$

$$Ni_{eq} = \%Ni + 0.31\%Mn + 22\%C + 14\%N + \%Cu,$$

$\%Cr$  = respective Cr content,

$\%Mo$  = respective Mo content,

$\%Nb$  = respective Nb content,

$\%Si$  = respective Si content,

$\%Ti$  = respective Ti content,

$\%Ni$  = respective Ni content,

$\%Mn$  = respective Mn content,

$\%C$  = respective C content,

$\%N$  = respective N content.

Box No. V      Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**With regard to the selected  $\text{Cr}_{\text{eq}}/\text{Ni}_{\text{eq}} \geq 1.7$ , it should be noted that any commercially available 18/8 alloy meets this requirement and, in consequence, this feature does not appear to be inventive anyway (see also D4).**

2.2 The subject matter of claim 1 therefore differs from that known from D1 and D2 in that the hydrogen content of the atmosphere (A) is between >0 mol% and 10 mol%.

2.3 The problem addressed by the present invention can consequently be regarded as that of adjusting the hydrogen content in such a way that the oxygen is bound, and the surface of the strip is thereby improved.

However, this is already known from documents D2 and D3 and the solution, as proposed in claim 1 of the present application, consequently cannot be considered inventive (PCT Article 33(3)).

2.4 A person skilled in the art would, without inventive input, combine all the features disclosed in D1 and D2 (see page 10, line 22 to page 11, line 5) or D3 (column 5, lines 49-61) in order to solve the problem of interest. Thus, the solution proposed in independent claim 1 cannot be considered inventive (PCT Article 33(3)).

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**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**International application No.  
PCT/EP2004/011848**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****3. DEPENDENT CLAIMS 2-9**

Claims 2-9 contain no features which, combined with the features of any claim to which they refer, meet the PCT requirements for novelty and/or inventive step.

**4. Industrial applicability**

Since the method can be used in the handling of melts in the casting industry, the invention is industrially applicable.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**International application No.  
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The following defects in the form or contents of the international application have been noted:

1. Claim 1 has been duly drafted in the two-part form, but a number of features should not have been included in the characterising part, since they were disclosed in D1 in conjunction with features indicated in the preamble (PCT Rule 6.3(b)).
  
2. Contrary to PCT Rule 5.1(a)(ii), the description does not cite documents D2 to D4 or indicate the relevant prior art disclosed therein.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**International application No.  
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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The formula 1 for the Cr and Ni equivalents specified in claim 1 cannot be found in D5 as set out in the claim.
  
2. According to claim 1, the hydrogen content may be between 0% and 10%. This is inconsistent with the description (see page 7), in which it is stated that a hydrogen content that is greater than 7.5% may give rise to explosive reactions.